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OZONE MONITORING IN THE SOUTHERN SIERRA NEVADA, 1976-1981

Report No. 82-17

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ABSTRACT

The Forest Pest Management staff, aided by several State and Federal cooperators, monitored ozone in the southern Sierra Nevada from 1976 through 1981. This report presents summary tables of data from six sites monitored at various times during that period: Whitaker Forest, Park Ridge Lookout, Lodgepole Ranger Station, Mountain Home Demonstration State Forest, Peppermint Heliport, and Greenhorn Summit. Federal and California ozone standards were exceeded at every site during each year monitored. Ozone levels were consistently highest at Greenhorn Summit, followed by Whitaker Forest. The highest hourly average ozone value was 17 parts per hundred million, recorded in July 1978 at Greenhorn Summit. Seasonal ozone doses declined from 1977 through 1980, but increased somewhat in 1981; weather was probably a factor in this trend. Although the level and duration of ozone maxima varied at the six sites, patterns were similar enough to conclude that potentially toxic ozone occurs throughout much of the range of susceptible conifers on and near the Sequoia National Forest.

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Since 1974, the Forest Pest Management staff has been evaluating ozone injury to susceptible conifers in the southern Sierra Nevada. The effort has had two objectives: to learn the extent, severity, and trends of ozone injury symptoms on ponderosa and Jeffrey pines, and to monitor the ozone levels present in the affected forests. Injury to pines has been reported in detail elsewhere (Williams et al. 1977, Pronos et al. 1978, Pronos and Vogler 1981, Vogler 1982). This report summarizes the results of ozone monitoring at six sites on or near the Sequoia National Forest from 1976 through 1981.

METHODS

Ozone was monitored with Dasibi 1003-AH ultraviolet absorption photometers, and data recorded continuously on Leeds and Northrup Speedomax H strip chart recorders.* Each monitor was installed inside a shed or other secure building. Ambient air was sampled through 6.35 mm (1/4 in) inside diameter Teflon tubing mounted on an exterior mast; the probe inlet was elevated 4-6 m (13-20 ft) above ground, and at least 1.5 m (5 ft) above roof line. Since all monitoring sites were forested, it was impossible to sample the air above crown height or more than 15 m (49 ft) from surrounding trees.

The California Air Resources Board calibrated the monitors annually through 1978. Thereafter, I performed all calibrations with a Dasibi 1003-PC ozone monitor calibrated as a transfer standard by the Air Resources Board or by an Environmental Protection Agency-designated contractor (Rockwell International, Newbury Park, California). On-site personnel checked the monitors weekly to assure that they were operating according to Air Resources Board specifications. I performed more thorough maintenance checks approximately once a month.

Ozone monitors were operated at six sites in the southern Sierra on or adjacent to the Sequoia National Forest (Figure 1); site descriptions are in Table 1. Monitoring began at Whitaker Experimental Forest in July 1976, and continued year-round through November 1981; at the other sites, monitoring was generally for periods of six months or less during the summer. Three monitors were placed in ponderosa pine-mixed conifer forests at 1645-1860 m (5400-6100 ft) elevation, while three others were located in higher elevation Jeffrey pine and true fir stands.

RESULTS AND DISCUSSION

Monthly and daily summaries of ozone monitoring are shown in Tables 5-16 in the Appendix (pages 7-43). At every site during each year monitored, Federal and California ozone standards [12 and 10 parts per

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*Note: Mention of proprietary products is solely for information; it does not constitute a guarantee or warranty of the product by the U. S. Department of Agriculture and does not imply its approval to the exclusion of other products that may also be suitable.

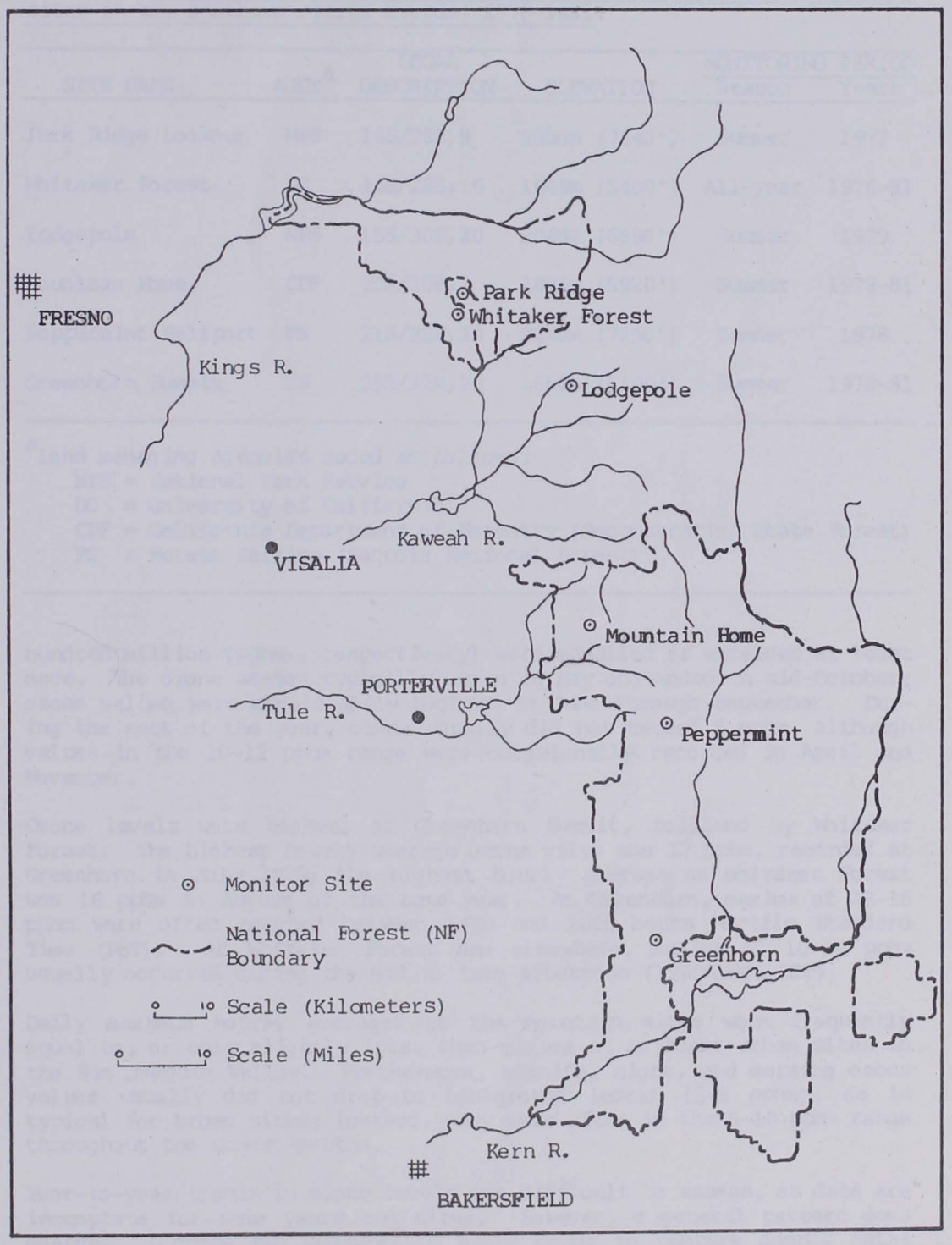

Figure 1. Locations of Forest Service-operated ozone monitors in the southern Sierra Nevada of California, 1976-1981.

Table 1. Characteristics of Forest Service-operated ozone monitoring sites in the southern Sierra Nevada, 1976-1981.

SITE NAME	AGCY[a]	LEGAL DESCRIPTION	ELEVATION	MONITORING PERIOD Season	Years
Park Ridge Lookout	NPS	14S/28E,9	2300m (7540')	Summer	1977
Whitaker Forest	UC	14S/28E,16	1645m (5400')	All-year	1976-81
Lodgepole	NPS	15S/30E,20	2040m (6690')	Summer	1979
Mountain Home	CDF	20S/30E,1	1805m (5920')	Summer	1978-81
Peppermint Heliport	FS	21S/32E,29	2210m (7250')	Summer	1978
Greenhorn Summit	FS	25S/32E,20	1860m (6100')	Summer	1978-81

[a]Land managing agencies coded as follows:
NPS = National Park Service
UC = University of California
CDF = California Department of Forestry (Demonstration State Forest)
FS = Forest Service (Sequoia National Forest)

hundred million (pphm), respectively] were equalled or exceeded at least once. The ozone season typically began in May and ended in mid-October; ozone values were consistently highest in June through September. During the rest of the year, ozone usually did not exceed 5 pphm, although values in the 10-12 pphm range were occasionally recorded in April and November.

Ozone levels were highest at Greenhorn Summit, followed by Whitaker Forest. The highest hourly average ozone value was 17 pphm, recorded at Greenhorn in July 1978; the highest hourly average at Whitaker Forest was 16 pphm in August of the same year. At Greenhorn, maxima of 12-16 pphm were often reached between 1400 and 2000 hours Pacific Standard Time (PST). At Whitaker Forest and elsewhere, maxima of 10-14 pphm usually occurred during the mid to late afternoon (1200-1800 PST).

Daily maximum hourly averages at the mountain sites were frequently equal to, or only slightly less, than maxima at adjacent urban sites in the San Joaquin Valley. Furthermore, evening, night, and morning ozone values usually did not drop to background levels (3-5 pphm), as is typical for urban sites; instead, they were often in the 8-10 pphm range throughout the summer months.

Year-to-year trends in ozone levels are difficult to assess, as data are incomplete for some years and sites. However, a general pattern does emerge. I chose two measures of ozone doses to compare annual data: the frequency of hours over the established standards, which emphasizes the peak values; and the mean value for the daylight hours (0900-2000

Table 2. Hours during which the Federal ozone standard (12 pphm) was exceeded at monitoring sites in the southern Sierra Nevada, June through September, 1976-1981.

SITE NAME	NUMBER OF HOURS DURING WHICH THE FEDERAL STANDARD WAS EXCEEDED					
	1976	1977	1978	1979	1980	1981
Whitaker Forest	(5)[a]	42	35	16	14	12
Mountain Home	ND	[1]	9	4	1	5
Greenhorn Summit	ND	ND	68	41	(20)	31

[a]For the years shown, 85% or more of the hours were recorded, except as follows: ( ) = 60%; [ ] = 45%; ND = no data.

Table 3. Hours during which the California ozone standard (10 pphm) was equalled or exceeded at monitoring sites in the southern Sierra Nevada, June through September, 1976-1981.

SITE NAME	NUMBER OF HOURS DURING WHICH THE CALIFORNIA STANDARD WAS EXCEEDED					
	1976	1977	1978	1979	1980	1981
Whitaker Forest	(142)[a]	561	390	389	223	343
Mountain Home	ND	[124]	193	211	27	204
Greenhorn Summit	ND	ND	844	674	(268)	621

[a]For the years shown, 85% or more of the hours were recorded, except as follows: ( ) = 60%; [ ] = 45%; ND = no data.

PST), which emphasizes the duration of high values. The number of hours during which the Federal standard was exceeded declined from 1977 through 1980, followed by an increase at two sites in 1981 (Table 2). A similar trend occurred in the frequency of hours over the California standard, with a more notable increase in ozone at all three sites in 1981 (Table 3). Trends in the means of daytime ozone values, although not as dramatic, were also similar (Table 4).

Weather patterns probably contributed to the duration and fluctuation of ozone levels, with the hotter, drier summers (1977 and 1981) having higher values during more hours than the cooler, wetter years (1978-1980).

Table 4. Means of daytime hourly average ozone levels during the summer months at monitoring sites in the southern Sierra Nevada, 1976-1981.

SITE NAME	MEAN DAYTIME (0900-2000 PST) OZONE VALUE DURING JUNE THROUGH SEPTEMBER					
	1976	1977	1978	1979	1980	1981
Whitaker Forest	(7.0)[a]	8.4	7.8	7.9	7.5	8.2
Mountain Home	ND	[7.3]	6.8	7.1	5.7	7.3
Greenhorn Summit	ND	ND	8.5	8.4	(8.2)	8.6

[a]For the years shown, 85% or more of the hours were recorded, except as follows: ( ) = 60%; [ ] = 45%; ND = no data.

CONCLUSIONS

Data from six years of ozone monitoring in the southern Sierra Nevada suggest several conclusions:

- Federal and State ozone standards are commonly exceeded at remote forested sites in the southern Sierra Nevada during the summer months. The highest hourly average values (16-17 pphm) were recorded at Whitaker Forest and Greenhorn Summit.

- Although the level and duration of ozone maxima varied at the six sites, patterns were similar enough to conclude that potentially toxic ozone occurs throughout most of the range of susceptible conifers on and near the Sequoia National Forest.

- Ozone values are highest during June through September, and daily maxima generally occur in the mid afternoon to early evening (1200-2000 PST).

- Annual trends in ozone levels were mixed, but seemed to fluctuate with weather patterns, the hotter, drier summers yielding higher values for a longer duration.

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APPENDIX:

MONTHLY AND DAILY SUMMARIES OF OZONE MONITORING AT SIX SITES IN THE SOUTHERN SIERRA NEVADA, 1976-1981

Tables 5-16 document the results of ozone monitoring on and near the Sequoia National Forest between 1976 and 1981. Monthly and daily summaries from the six sites are numbered as follows:

MONITOR SITE	TABLE NUMBERS (Monthly Summary)	(Daily Summary)
Whitaker Forest	5a - 5f	11a - 11f
Park Ridge Lookout	6a	12a
Lodgepole	7a	13a
Mountain Home	8a - 8e	14a - 14e
Peppermint Heliport	9a	15a
Greenhorn Summit	10a - 10d	16a - 16d

TERMINOLOGY

Hours Monitored: Percent of all hours in the month for which at least 30 minutes of acceptable data were recorded.

Maximum Hourly Average: The highest hourly average ozone value for the month.

Mean of Daily Maxima: The mean of the daily maximum hourly averages for the month.

Mean of Daylight Hours: Monthly mean of all hourly average ozone values for the daylight hours (0900-2000 PST) during the summer (June through September).

Frequencies of Hourly Averages Exceeding Established Standards: Number of days and hours in one month during which the California or Federal standards were exceeded.

California Standard: Exceeded when the hourly average ozone level was equal to or greater than 10 pphm.

Federal Standard: Exceeded when the hourly average ozone level was greater than 12 pphm.

Table 5a. Monthly Summary of Ozone Monitoring at Whitaker Forest in 1976.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
APRIL	52	7	9	5	*[a]	0	0	0	0
MAY	22	9	2	6	*	0	0	0	0
JUNE	9	6	3	6	4.3	0	0	0	0
JULY	52	13	1	10	7.9	31	8	1	1
AUGUST	84	14	2	9	7.4	59	12	4	2
SEPTEMBER	97	12	9	8	6.4	52	13	0	0
OCTOBER	99	11	4	8	*	12	5	0	0
NOVEMBER	93	9	2	5	*	0	0	0	0
DECEMBER	97	9	2	6	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 5b. Monthly Summary of Ozone Monitoring at Whitaker Forest in 1977.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JANUARY	88	6	8	5	*[a]	0	0	0	0
FEBRUARY	78	10	1	6	*	1	1	0	0
MARCH	100	8	9	6	*	0	0	0	0
APRIL	100	12	1	8	*	32	9	0	0
MAY	99	12	1	6	*	10	2	0	0
JUNE	98	14	1	10	8.2	131	23	3	2
JULY	98	15	1	11	9.0	175	22	14	6
AUGUST	100	14	4	11	9.2	208	25	18	8
SEPTEMBER	98	13	7	9	7.2	47	13	7	3
OCTOBER	88	12	1	8	*	24	8	0	0
NOVEMBER	93	10	3	5	*	3	1	0	0
DECEMBER	89	5	4	3	*	0	0	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 5c. Monthly Summary of Ozone Monitoring at Whitaker Forest in 1978.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JANUARY	87	5	3	2	*[a]	0	0	0	0
FEBRUARY	31	3	13	2	*	0	0	0	0
MARCH	74	7	2	3	*	0	0	0	0
APRIL	93	7	2	4	*	0	0	0	0
MAY	100	11	1	7	*	7	2	0	0
JUNE	99	13	5	10	8.3	79	20	5	3
JULY	99	14	8	11	9.3	188	26	19	8
AUGUST	97	16	1	10	8.2	117	18	11	5
SEPTEMBER	93	10	6	7	5.1	6	3	0	0
OCTOBER	99	12	5	9	*	48	13	0	0
NOVEMBER	100	11	2	5	*	3	1	0	0
DECEMBER	70	5	5	4	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 5d. Monthly Summary of Ozone Monitoring at Whitaker Forest in 1979.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JANUARY	98	5	2	4	*[a]	0	0	0	0
FEBRUARY	66	6	1	5	*	0	0	0	0
MARCH	0	--	--	--	--	--	--	--	--
APRIL	57	9	6	6	*	0	0	0	0
MAY	99	12	1	8	*	32	9	0	0
JUNE	99	14	2	10	8.6	114	22	8	4
JULY	93	13	2	10	8.0	92	18	2	1
AUGUST	96	13	6	10	8.3	133	18	6	4
SEPTEMBER	97	12	3	9	7.2	50	15	0	0
OCTOBER	99	13	1	7	*	25	6	1	1
NOVEMBER	98	6	4	4	*	0	0	0	0
DECEMBER	88	6	1	4	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 5e. Monthly Summary of Ozone Monitoring at Whitaker Forest in 1980.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JANUARY	58	7	1	4	*[a]	0	0	0	0
FEBRUARY	79	7	1	4	*	0	0	0	0
MARCH	50	7	1	6	*	0	0	0	0
APRIL	56	10	3	6	*	3	1	0	0
MAY	75	10	2	6	*	2	2	0	0
JUNE	100	11	8	8	6.9	22	6	0	0
JULY	98	14	5	10	8.3	82	21	9	3
AUGUST	99	13	5	10	8.5	103	21	5	3
SEPTEMBER	93	11	4	8	6.3	16	7	0	0
OCTOBER	97	13	1	7	*	23	7	1	1
NOVEMBER	100	10	5	6	*	5	3	0	0
DECEMBER	99	7	1	4	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 5f. Monthly Summary of Ozone Monitoring at Whitaker Forest in 1981.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JANUARY	85	5	11	4	*[a]	0	0	0	0
FEBRUARY	0	--	--	--	--	--	--	--	--
MARCH	0	--	--	--	--	--	--	--	--
APRIL	0	--	--	--	--	--	--	--	--
MAY	66	11	1	7	*	4	2	0	0
JUNE	100	13	3	10	7.6	76	18	3	2
JULY	74	14	2	11	9.4	132	22	6	2
AUGUST	89	13	3	10	8.5	109	23	3	2
SEPTEMBER	77	12	1	9	7.5	26	11	0	0
OCTOBER	100	12	2	7	*	15	4	0	0
NOVEMBER	5	5	5	5	*	0	0	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 6a. Monthly Summary of Ozone Monitoring at Park Ridge Lookout in 1977.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
APRIL	14	8	1	6	*[a]	0	0	0	0
MAY	99	9	4	6	*	0	0	0	0
JUNE	85	12	1	9	6.7	28	7	0	0
JULY	100	13	4	9	7.4	100	17	4	3
AUGUST	100	13	1	10	7.9	132	20	1	1
SEPTEMBER	99	12	2	8	6.0	19	4	0	0
OCTOBER	32	9	2	7	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000.

Table 7a. Monthly Summary of Ozone Monitoring at Lodgepole Ranger Station in 1979.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JULY	24	12	3	11	8.9	33	8	0	0
AUGUST	29	13	1	10	8.3	32	6	1	1
SEPTEMBER	78	12	2	9	7.0	18	9	0	0
OCTOBER	99	11	1	6	*[a]	6	3	0	0
NOVEMBER	39	6	5	4	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000.

Table 8a. Monthly Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1977.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
AUGUST	88	13	1	10	8.0	96	21	1	1
SEPTEMBER	96	12	2	8	6.6	28	10	0	0
OCTOBER	81	13	3	9	*[a]	31	11	3	2
NOVEMBER	67	10	1	6	*	1	1	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 8b. Monthly Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1978.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	84	12	8	8	7.4	29	8	0	0
JULY	94	13	3	10	8.3	108	22	3	1
AUGUST	98	14	3	9	7.5	54	13	6	2
SEPTEMBER	100	10	2	6	4.0	2	1	0	0
OCTOBER	97	12	1	8	*[a]	15	7	0	0
NOVEMBER	68	9	2	4	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 8c. Monthly Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1979.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	83	13	4	10	7.6	56	14	4	1
JULY	100	12	4	10	7.7	71	18	0	0
AUGUST	98	12	5	9	7.1	62	12	0	0
SEPTEMBER	100	12	2	8	6.0	22	9	0	0
OCTOBER	100	11	4	6	*[a]	9	4	0	0
NOVEMBER	15	6	1	4	*	0	0	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 8d. Monthly Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1980.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	58	10	4	8	6.0	4	3	0	0
JULY	91	13	1	8	6.5	18	6	1	1
AUGUST	99	11	1	8	6.0	4	2	0	0
SEPTEMBER	99	10	1	6	4.6	1	1	0	0
OCTOBER	72	12	3	7	*[a]	13	7	0	0
NOVEMBER	46	8	2	5	*	0	0	0	0

[a]The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 8e. Monthly Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1981.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
MAY	9	8	3	7	*[a]	0	0	0	0
JUNE	100	13	2	9	7.0	31	9	2	1
JULY	100	12	5	10	8.5	99	24	0	0
AUGUST	100	13	3	10	7.5	62	17	3	1
SEPTEMBER	100	11	1	8	6.2	12	7	0	0
OCTOBER	87	10	3	5	*	3	1	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 9a. Monthly Summary of Ozone Monitoring at Peppermint Heliport in 1978.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	61	12	2	9	7.3	24	7	0	0
JULY	63	13	1	10	7.2	46	11	1	1
AUGUST	69	12	2	9	7.3	51	12	0	0
SEPTEMBER	82	9	7	6	5.1	0	0	0	0
OCTOBER	19	9	2	8	*[a]	0	0	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000.

Table 10a. Monthly Summary of Ozone Monitoring at Greenhorn Summit in 1978.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	86	13	3	10	8.1	121	17	3	1
JULY	100	17	1	12	9.0	288	26	26	11
AUGUST	93	14	4	12	9.7	357	30	33	11
SEPTEMBER	94	14	1	9	7.2	78	15	6	3
OCTOBER	96	15	3	11	*[a]	187	23	35	9
NOVEMBER	10	11	2	8	*	4	1	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 10b. Monthly Summary of Ozone Monitoring at Greenhorn Summit in 1979.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	93	14	3	11	9.3	232	23	28	9
JULY	100	14	3	11	8.5	187	23	8	4
AUGUST	100	13	1	10	8.4	165	20	1	1
SEPTEMBER	97	13	4	10	7.3	90	17	4	3
OCTOBER	92	14	1	8	*[a]	41	7	5	2
NOVEMBER	81	8	1	5	*	0	0	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000 PST.

Table 10c. Monthly Summary of Ozone Monitoring at Greenhorn Summit in 1980.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
JUNE	12	13	1	11	8.1	10	3	1	1
JULY	100	15	1	11	8.7	180	21	15	7
AUGUST	48	14	3	11	8.6	63	10	5	3
SEPTEMBER	75	12	2	9	7.1	25	6	0	0
OCTOBER	24	14	1	11	*[a]	17	5	3	2

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000.

Table 10d. Monthly Summary of Ozone Monitoring at Greenhorn Summit in 1981.

MONTH	HOURS MONITORED (Percent)	MAXIMUM HOURLY AVERAGE VALUE (Pphm)	MAXIMUM HOURLY AVERAGE FREQUENCY (Hours)	MEAN of DAILY MAXIMA (Pphm)	MEAN of DAYLIGHT HOURS (Pphm)	FREQUENCIES OF HOURLY AVERAGES EXCEEDING ESTABLISHED STANDARDS: STATE [10 Pphm] (Hours)	STATE [10 Pphm] (Days)	FEDERAL [12 Pphm] (Hours)	FEDERAL [12 Pphm] (Days)
APRIL	11	9	1	6	*[a]	0	0	0	0
MAY	100	10	2	8	*	2	2	0	0
JUNE	92	14	1	10	8.0	107	14	3	2
JULY	83	14	4	11	9.5	204	21	5	2
AUGUST	100	16	2	12	9.4	231	31	20	8
SEPTEMBER	99	15	1	10	7.8	79	22	3	1
OCTOBER	100	11	3	6	*	12	2	0	0
NOVEMBER	54	9	4	6	*	0	0	0	0

[a] The means of daylight hourly averages were calculated for the summer months June through September only; daylight hours are from 0900 to 2000.

Table 11a. Daily Summary of Ozone Monitoring at Whitaker Forest in 1976.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
APR															4	4	4	4	4	5	7	6	5	6	4	4	5	6	7	7	X
MAY	9	6	7	7	5	5	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	-	-	-	-	-	-	-	-	-	-	-	X
JUL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	9	8	9	9	10	6	10	10	10	11	9	12	13	12	8
AUG	8	8	7	6	7	7	7	8	10	12	13	12	9	7	4	7	9	6	5	8	10	7	9	10	11	11	10	10	8	12	14
SEP	12	10	12	10	8	8	10	11	9	6	5	5	7	10	8	7	8	9	9	10	10	10	-	10	10	10	8	6	3	5	X
OCT	4	4	4	5	6	7	8	9	8	9	11	9	8	9	11	11	9	10	7	10	6	7	6	8	7	5	6	6	6	8	8
NOV	7	6	7	5	5	5	6	6	8	9	8	4	5	2	2	3	3	4	3	4	4	4	4	4	5	4	4	5	4	4	X
DEC	5	4	4	6	7	5	5	5	9	6	5	5	6	6	5	5	5	6	6	6	7	5	6	6	5	5	5	5	7	7	4

Table 11b. Daily Summary of Ozone Monitoring at Whitaker Forest in 1977.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JAN	4	4	-	-	-	4	4	4	5	5	4	5	4	4	4	4	6	4	4	4	4	5	6	5	5	6	5	5	4	5	5
FEB	5	5	5	6	6	-	5	-	-	-	-	6	8	6	7	7	10	6	6	8	6	5	5	4	5	5	6	8	X	X	X
MAR	4	5	6	6	6	6	6	8	8	5	6	8	5	6	5	6	5	6	5	7	7	7	8	5	4	5	7	6	6	6	6
APR	6	6	7	7	8	9	11	8	5	6	7	9	9	8	10	11	10	8	7	9	10	7	10	12	9	8	10	10	9	8	X
MAY	5	7	6	7	7	6	5	5	4	4	3	3	3	3	6	3	4	5	4	8	8	6	4	6	8	7	6	9	9	10	12
JUN	12	11	11	10	11	7	6	9	4	4	8	11	11	10	11	12	9	10	11	10	11	11	10	12	11	10	12	13	11	14	X
JUL	11	9	8	7	9	11	12	13	10	9	13	15	12	12	10	9	13	11	9	9	10	10	12	9	10	10	12	13	12	14	12
AUG	13	11	14	10	13	11	10	12	13	13	13	12	12	12	13	12	7	8	11	12	11	10	14	9	7	6	10	10	11	9	11
SEP	10	13	13	11	8	8	8	8	7	8	10	10	13	10	8	5	6	5	5	5	8	8	10	10	10	10	9	10	6	8	X
OCT	8	9	10	8	5	6	8	10	-	-	-	9	12	10	6	8	8	8	9	10	9	9	9	11	10	11	8	6	6	7	7
NOV	6	9	9	10	7	-	-	4	4	4	3	5	8	6	6	7	6	8	7	3	3	1	2	2	2	4	5	3	4	4	X
DEC	3	5	5	5	4	3	4	3	3	3	4	2	2	2	2	2	2	2	2	2	2	-	2	2	1	1	2	2	2	2	2

Table 11c. Daily Summary of Ozone Monitoring at Whitaker Forest in 1978.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JAN	2	2	2	2	2	2	2	1	2	3	3	1	2	3	3	2	2	2	-	-	-	-	2	2	2	2	2	2	2	4	5
FEB	3	2	3	2	3	2	2	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X
MAR	-	-	-	-	-	-	-	-	2	2	3	3	2	2	3	4	3	3	5	4	3	2	3	2	3	3	5	4	7	2	4
APR	3	2	2	4	3	3	3	3	3	3	5	7	4	3	-	-	-	3	5	3	3	4	5	5	3	3	2	4	4	4	X
MAY	2	3	6	6	4	5	5	5	7	7	5	5	6	9	4	4	6	7	8	9	10	9	6	6	6	7	9	9	9	11	9
JUN	10	9	10	9	9	9	10	12	13	8	8	10	10	10	11	10	11	10	11	13	13	12	10	10	8	10	7	8	8	10	X
JUL	12	7	7	9	10	12	12	13	12	11	9	11	12	12	12	9	11	11	12	13	14	11	12	12	10	11	13	14	14	14	13
AUG	13	16	14	12	13	12	11	10	11	12	11	13	8	9	11	10	8	9	9	11	10	7	8	9	9	9	8	9	12	11	7
SEP	9	6	6	5	2	3	4	7	8	4	6	8	8	5	6	6	-	6	6	7	7	8	7	6	7	10	9	9	10	10	X
OCT	12	12	10	11	8	8	9	10	7	12	10	7	9	6	11	10	8	8	9	12	8	7	7	6	6	9	11	11	11	8	6
NOV	5	4	4	8	8	7	9	8	11	8	5	4	4	4	4	6	6	4	5	5	5	4	3	4	4	4	4	4	5	5	X
DEC	4	4	4	3	4	3	3	4	4	3	3	3	4	4	5	4	4	-	-	-	-	-	-	-	-	-	4	5	4	4	4

Table 11d. Daily Summary of Ozone Monitoring at Whitaker Forest in 1979.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JAN	4	4	4	4	3	4	4	3	-	3	4	4	3	4	4	3	3	4	4	4	4	4	4	5	4	4	4	4	4	4	4
FEB	4	4	4	5	5	5	5	5	6	5	5	5	5	-	4	4	4	4	4	4	-	-	-	-	-	-	-	-	X	X	X
MAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	9	5	5	6	7	8	9	5	5	5	-	4	5	6	7	X
MAY	5	4	6	9	9	4	5	4	5	7	8	7	8	8	10	11	10	10	12	11	8	9	9	8	8	10	9	8	9	10	10
JUN	9	10	10	9	12	12	9	9	10	10	8	11	11	10	10	10	6	6	9	11	11	11	13	13	12	12	13	14	12	10	X
JUL	10	8	8	8	7	9	10	9	11	-	-	11	12	13	11	8	10	10	8	9	8	9	11	12	12	11	10	12	10	12	12
AUG	13	13	13	11	11	9	12	12	12	13	10	10	7	8	9	8	8	9	11	8	8	10	11	10	11	10	12	11	6	7	7
SEP	10	9	8	9	10	11	11	12	11	10	7	10	11	11	8	12	8	11	11	10	9	10	6	6	6	8	7	7	9	7	X
OCT	7	6	9	11	13	12	10	6	7	8	11	11	9	7	6	7	8	8	4	4	4	5	6	7	6	2	4	5	4	5	7
NOV	6	5	6	3	3	4	5	4	5	5	4	4	5	4	4	4	4	3	3	4	4	4	3	3	3	3	3	3	4	4	X
DEC	4	4	3	3	5	4	4	4	5	6	4	3	3	3	4	3	3	4	5	4	4	4	4	3	-	-	4	4	4	3	3

Table 11e. Daily Summary of Ozone Monitoring at Whitaker Forest in 1980.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JAN	2	3	3	4	4	3	3	7	4	-	-	-	-	-	-	-	3	3	-	-	-	-	-	-	-	5	5	4	4	4	3
FEB	4	4	4	3	4	4	4	4	4	5	5	7	5	4	4	3	4	-	-	-	-	-	-	-	4	4	4	4	4	X	X
MAR	4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	5	7	5	5	6	6	6	6	5	6	6	6	6
APR	5	6	7	-	5	4	4	5	7	6	6	6	7	7	6	6	9	10	7	-	-	-	-	-	-	-	-	-	-	-	X
MAY	-	-	-	-	-	-	-	9	5	6	5	4	5	5	5	7	9	8	10	10	8	4	5	5	5	6	6	5	7	8	6
JUN	7	7	6	7	7	8	9	8	9	9	7	6	7	7	8	10	11	11	10	10	9	8	7	9	9	9	8	11	8	6	X
JUL	8	7	6	8	9	10	10	9	7	10	12	11	8	9	10	10	12	12	11	9	12	11	13	14	14	10	10	10	10	11	10
AUG	13	11	10	10	10	12	11	12	-	12	13	13	11	9	8	11	11	10	8	11	10	10	9	8	9	11	12	10	9	8	8
SEP	9	10	11	8	10	9	8	8	8	9	10	9	8	5	5	9	7	9	7	8	7	8	11	-	-	7	11	9	7	10	X
OCT	10	9	10	9	9	10	13	12	10	11	9	6	6	4	3	3	4	6	5	6	7	8	8	6	8	-	4	6	6	6	5
NOV	8	9	6	8	6	10	10	10	7	6	6	4	4	6	7	5	5	6	5	4	4	7	7	4	4	4	5	4	4	5	X
DEC	6	3	3	3	3	3	4	4	4	3	3	3	4	3	3	4	4	6	7	5	3	4	4	4	4	3	3	3	4	4	4

Table 11f. Daily Summary of Ozone Monitoring at Whitaker Forest in 1981.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JAN	4	4	4	5	4	4	4	5	5	4	4	5	5	4	4	5	4	4	5	4	3	4	4	3	3	3	4	-	-	-	-
FEB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X
MAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
MAY	-	-	-	-	-	-	-	-	-	-	9	8	9	7	5	5	7	8	4	4	6	8	8	8	3	3	4	7	11	10	8
JUN	8	8	8	10	10	10	8	8	7	11	10	6	8	7	8	8	11	13	11	13	10	11	12	12	11	12	12	9	11	11	X
JUL	10	12	10	14	10	10	11	11	11	11	11	10	11	12	12	12	12	13	10	11	12	-	11	-	-	-	-	-	-	-	-
AUG	-	-	-	10	10	11	12	13	11	12	12	11	10	11	11	10	11	13	10	10	11	10	12	11	9	10	11	6	8	8	8
SEP	10	10	10	10	9	9	10	9	10	10	8	8	9	7	12	10	-	-	-	-	-	-	-	10	8	9	9	8	7	10	X
OCT	8	7	6	6	7	8	9	7	8	8	5	5	6	6	6	8	8	7	9	8	10	10	12	12	9	9	6	5	4	4	4
NOV	5	5																													

Table 12a. Daily Summary of Ozone Monitoring at Park Ridge Lookout in 1977.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
APR																				7	8	6	6	-	-	-	-	-	6	6	X
MAY	3	4	4	4	5	4	4	7	7	5	4	4	4	3	6	4	4	5	5	8	8	8	7	8	6	5	5	7	6	8	9
JUN	9	8	8	8	7	7	4	-	-	-	-	-	8	8	8	11	10	7	8	8	8	8	9	10	10	9	10	11	9	12	X
JUL	8	6	6	5	6	9	10	10	8	8	11	13	13	11	8	7	13	9	7	7	8	9	10	8	7	9	10	11	10	12	10
AUG	10	11	12	9	12	12	9	10	12	12	11	10	12	11	11	11	8	8	10	11	10	9	13	8	6	5	9	9	12	10	9
SEP	9	11	11	9	6	7	7	6	8	8	9	8	12	10	8	5	5	5	5	4	6	7	8	8	8	8	7	9	8	6	X
OCT	7	7	8	6	4	-	-	-	-	-	-	-	-	9	6	7	7	7	-	-	-	-	-	-	-	-	-				

Table 13a. Daily Summary of Ozone Monitoring at Lodgepole Ranger Station in 1979.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUL																								12	11	10	11	12	10	11	12
AUG	12	12	13	11	10	9	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	8
SEP	10	9	9	9	9	7	10	10	6	8	8	10	10	8	8	12	9	10	12	9	-	-	-	-	-	-	-	-	7	8	X
OCT	8	6	6	8	9	10	10	6	6	5	11	9	9	6	5	7	7	8	5	4	3	4	5	6	6	2	4	5	4	5	7
NOV	5	5	6	3	4	4	5	4	3	4	4	4	4																		

Table 14a. Daily Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1977.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
AUG				8	11	10	11	10	11	12	13	12	12	12	11	10	4	5	12	12	11	10	11	8	8	6	9	11	11	10	10
SEP	10	8	11	9	10	9	7	7	8	8	10	-	12	10	9	6	6	5	5	4	8	8	9	12	10	8	10	10	5	7	X
OCT	8	8	10	6	6	5	8	12	10	10	9	11	13	11	-	6	8	9	10	-	-	-	-	13	11	10	7	6	7	6	6
NOV	5	9	6	-	6	4	4	5	5	4	4	5	6	6	5	5	5	10	8	4	-										

Table 14b. Daily Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1978.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN					8	8	8	9	10	7	7	9	8	8	8	10	10	9	10	12	12	11	9	10	8	8	6	7	8	9	X
JUL	10	6	7	8	8	9	11	12	11	9	7	9	11	11	10	9	10	10	11	12	13	12	11	11	12	12	11	11	11	11	10
AUG	12	11	12	12	14	13	10	9	8	9	8	9	8	8	9	10	7	8	9	10	9	7	8	10	10	7	8	9	10	12	7
SEP	8	7	6	3	1	2	3	5	7	3	4	7	7	4	5	6	8	4	4	6	7	6	7	4	6	9	7	6	7	10	X
OCT	11	10	9	9	8	7	6	10	-	10	10	8	7	6	10	9	6	8	8	9	7	5	6	5	7	9	8	9	12	7	5
NOV	4	5	4	6	5	4	5	3	9	5	3	3	3	2	3	3	4	3	3	4	-										

Table 14c. Daily Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1979.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN					11	12	8	7	9	9	9	8	7	9	10	9	4	5	8	10	10	11	12	11	11	11	12	13	10	10	X
JUL	9	7	8	8	7	9	10	10	11	9	8	9	12	11	10	8	12	11	9	8	10	9	10	12	11	10	10	10	10	10	11
AUG	12	12	11	12	11	10	11	10	10	12	8	8	6	7	9	8	9	7	8	7	-	10	9	9	10	9	9	9	5	5	9
SEP	9	10	9	8	9	10	10	10	8	10	9	10	11	8	8	11	8	9	12	9	9	9	5	4	5	5	7	5	6	6	X
OCT	7	6	5	9	11	10	9	5	5	7	11	10	8	6	4	6	6	7	5	1	2	4	5	7	4	2	4	4	3	5	7
NOV	4	4	6	2	-																										

Table 14d. Daily Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1980.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN				5	5	6	7	-	-	-	-	-	-	-	-	-	9	10	9	9	8	7	6	7	8	10	8	10	7	8	X
JUL	5	7	5	8	7	9	8	8	6	9	9	9	6	6	9	10	10	10	9	8	-	-	-	13	11	10	6	9	7	9	9
AUG	10	7	7	8	7	9	9	9	11	9	9	9	9	6	6	8	8	7	5	8	8	8	6	6	7	9	8	6	6	6	5
SEP	6	8	8	6	8	8	5	6	5	7	8	8	6	4	3	7	8	8	5	5	5	7	8	6	6	5	10	8	5	7	X
OCT	10	10	9	10	10	10	8	12	12	9	8	7	5	3	3	3	4	-	6	6	7	7	4	5	7	-	-	-	3	3	3
NOV	6	7	4	4	4	7	8	7	6	3	4	5	3	6	6	4	-														

Table 14e. Daily Summary of Ozone Monitoring at Mountain Home Demonstration State Forest in 1981.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
MAY																												6	8	8	7
JUN	8	7	8	7	9	8	8	8	8	9	8	5	7	5	7	10	10	10	12	10	9	9	13	10	8	10	10	8	8	9	X
JUL	8	9	11	12	8	10	8	9	10	10	10	10	10	10	10	11	10	10	9	11	11	11	12	10	11	10	10	12	11	8	10
AUG	9	9	9	8	10	10	12	13	11	11	11	10	9	8	10	9	10	10	10	10	10	10	11	8	6	11	8	5	8	7	8
SEP	9	8	8	9	10	8	8	9	10	9	6	8	10	8	10	10	5	9	11	9	8	7	10	8	8	8	9	6	4	4	X
OCT	6	5	4	4	7	6	6	4	6	6	-	2	2	3	3	5	5	5	5	5	9	8	9	10	7	5	4	-	-		

Table 15a. Daily Summary of Ozone Monitoring at Peppermint Heliport in 1978.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN		9	10	8	9	9	9	8	12	8	7	9	-	8	10	9	7	8	11	10	11	-	-	-	-	-	-	-	-	-	X
JUL	-	-	-	-	-	-	-	-	-	-	-	8	9	11	10	9	8	9	10	13	11	10	8	9	10	12	10	8	12	10	9
AUG	12	10	10	11	11	10	10	6	9	10	10	10	7	7	12	-	-	-	-	-	-	-	-	-	-	8	7	8	9	11	8
SEP	8	8	7	6	0	-	-	-	-	4	-	6	7	8	6	6	9	7	5	5	7	7	6	6	6	6	9	7	8	9	X
OCT	9	8	8	8	7	6																									

Table 16a. Daily Summary of Ozone Monitoring at Greenhorn Summit in 1978.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN			11	10	10	9	9	11	12	9	8	10	11	9	10	11	11	9	11	12	12	13	11	10	9	9	8	8	-	10	X
JUL	11	9	9	9	11	10	10	13	12	12	8	11	17	13	12	10	11	9	12	13	14	13	10	14	10	12	14	11	13	13	13
AUG	13	14	14	13	11	13	11	11	11	12	13	14	10	11	12	13	-	11	12	13	11	10	13	12	11	11	10	10	12	13	10
SEP	10	10	7	8	4	4	6	10	12	7	8	13	12	10	9	11	12	7	7	9	10	11	10	9	8	14	13	-	9	11	X
OCT	14	14	13	10	9	9	9	12	10	14	12	10	8	11	14	12	10	13	12	14	11	10	9	8	10	12	12	13	15	9	8
NOV	8	8	8	11	6	-																									

Table 16b. Daily Summary of Ozone Monitoring at Greenhorn Summit in 1979.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN	8	10	11	9	14	14	8	8	11	11	11	11	10	12	12	9	5	7	12	13	12	12	13	13	13	13	13	13	12	12	X
JUL	11	9	9	9	9	10	10	10	11	11	10	10	14	13	13	9	14	9	11	8	11	9	11	12	12	11	10	10	12	11	11
AUG	12	12	13	11	10	10	12	11	12	12	11	9	7	10	11	10	9	9	8	8	8	11	12	11	12	10	9	9	7	8	11
SEP	11	10	8	10	10	13	12	10	11	9	8	10	11	12	10	13	9	10	12	13	10	9	8	5	6	7	8	8	9	5	X
OCT	5	7	7	12	14	11	10	-	7	7	13	10	10	6	6	8	8	9	6	5	5	5	7	9	8	5	6	6	5	6	8
NOV	6	7	8	4	4	5	6	6	6	7	7	5	5	5	5	5	5	5	4	5	6	5	5	4	-						

Table 16c. Daily Summary of Ozone Monitoring at Greenhorn Summit in 1980.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
JUN																											12	13	9	10	X
JUL	8	8	7	11	9	9	9	9	9	10	13	10	9	9	10	12	13	12	12	11	13	11	12	14	14	13	10	11	10	10	15
AUG	12	11	9	9	8	12	14	10	14	12	11	14	11	9	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEP	-	-	-	-	-	-	-	-	8	8	11	10	9	7	6	9	12	10	8	8	9	9	9	9	9	8	10	11	7	9	X
OCT	10	8	10	9	11	13	14	-																							

Table 16d. Daily Summary of Ozone Monitoring at Greenhorn Summit in 1981.

MONTH	DAILY MAXIMUM HOURLY AVERAGE OZONE (in Parts per Hundred Million) FOR EACH DAY OF THE MONTH																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
APR																											5	6	5	9	X
MAY	10	8	7	8	8	8	7	7	9	9	8	9	10	9	6	5	7	6	4	6	7	9	8	8	7	5	5	8	9	9	8
JUN	9	8	8	10	8	9	8	8	9	10	8	7	8	8	8	11	11	13	12	11	10	10	11	12	10	11	14	-	-	-	X
JUL	9	12	14	14	-	10	8	10	10	10	10	10	11	12	12	12	11	11	10	12	12	12	11	11	-	-	-	-	-	9	9
AUG	10	11	10	10	13	12	14	16	13	10	13	11	10	12	12	12	14	12	11	12	12	12	14	10	13	12	11	10	10	11	10
SEP	12	10	10	10	8	11	7	10	10	11	11	10	10	10	10	15	8	11	11	10	10	9	10	10	9	10	12	8	4	5	X
OCT	4	7	5	6	6	7	7	5	7	7	4	4	5	5	6	7	7	7	6	7	10	7	9	11	8	7	6	4	6	6	6
NOV	5	5	5	8	9	7	6	6	6	8	7	6	4	4	5	4	-														